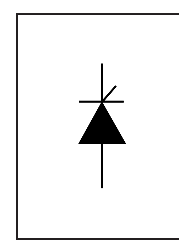
Bulletin I2107 rev. G 09/03

International
IOR Rectifier

*SAFE**IR*** Series 40TPS..

PHASE CONTROL SCR



V_T < 1.45V @ 40A
I_{TSM} = 500A
V_{RRM} = 800 - 1200V

Description/ Features

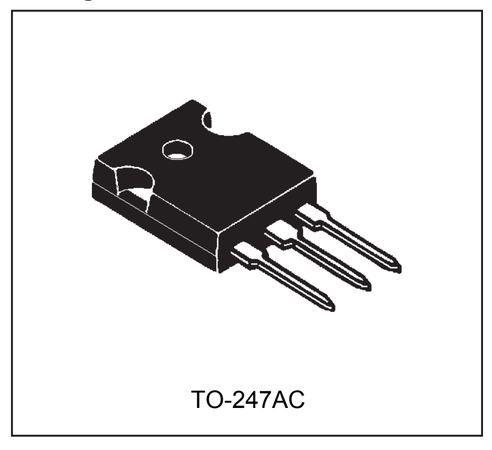
The 40TPS... *SAFE**IR*** series of silicon controlled rectifiers are specifically designed for medium power switching and phase control applications. The glass passivation technology used has reliable operation up to 125°C junction temperature. Low Igt parts available.

Typical applications are in input rectification (soft start) and these products are designed to be used with International Rectifier input diodes, switches and output rectifiers which are available in identical package outlines.

Major Ratings and Characteristics

Characteristics		40TPS..	Units
$I_{T(AV)}$	Sinusoidal waveform	35	A
I_{RMS}		55	A
V_{RRM}/ V_{DRM} Range		800 - 1200	V
I_{TSM}		500	A
V_T	@ 40 A, T_J = 25°C	1.45	V
dv/dt		1000	V/µs
di/dt		100	A/µs
T_J		- 40 to 125	°C

Package Outline



TO-247AC



Voltage Ratings

Part Number	V_{RRM}/ V_{DRM}, max. repetitive peak and off-state voltage V	V_{RSM} , maximum non repetitive peak reverse voltage V	I_{RRM}/ I_{DRM} 125°C mA
40TPS08	800	900	10
40TPS12	1200	1300	

Absolute Maximum Ratings

	Parameters	40TPS..	Units	Conditions	
$I_{T(AV)}$	Max. Average On-state Current	35	A	@ T_C = 79° C, 180° conduction half sine wave	
$I_{T(RMS)}$	Max. Continuous RMS On-state Current As AC switch	55			
I_{TSM}	Max. Peak One Cycle Non-Repetitive Surge Current	500	A	10ms Sine pulse, rated V_{RRM} applied	Initial $T_J = T_J$ max.
		600		10ms Sine pulse, no voltage reapplied	
I^2t	Max. I^2t for Fusing	1250	A^2s	10ms Sine pulse, rated V_{RRM} applied	
		1760		10ms Sine pulse, no voltage reapplied	
$I^2\sqrt{t}$	Max. $I^2\sqrt{t}$ for Fusing	12500	$A^2\sqrt{s}$	t = 0.1 to 10ms, no voltage reapplied	
$V_{T(TO)1}$	Low Level Value of Threshold Voltage	1.02	V	T_J = 125°C	
$V_{T(TO)2}$	High Level Value of Threshold Voltage	1.23			
r_{t1}	Low Level Value of On-state Slope Resistance	9.74	mΩ		
r_{t2}	High Level Value of On-state Slope Resistance	7.50			
V_{TM}	Max. Peak On-state Voltage	1.85	V	@ 110A, T_J = 25°C	
di/dt	Max. Rate of Rise of Turned-on Current	100	A/μs	T_J = 25°C	
I_H	Max. Holding Current	150	mA		
I_L	Max. Latching Current	300			
I_{RRM}/ I_{DRM}	Max. Reverse and Direct Leakage Current	0.5	mA	T_J = 25°C	V_R = rated V_{RRM}/ V_{DRM}
		10		T_J = 125°C	
dv/dt	Max. Rate of Rise of Off-state Voltage — 40TPS08	500	V/μs	$T_J = T_J$ max., linear to 80% V_{DRM} , R_g-k = open	
	40TPS12	1000			

Triggering

	Parameters	40TPS..	Units	Conditions	
P_{GM}	Max. peak Gate Power	10	W		
$P_{G(AV)}$	Max. average Gate Power	2.5			
I_{GM}	Max. peak Gate Current	2.5	A		
$-V_{GM}$	Max. peak negative Gate Voltage	10	V		
V_{GT}	Max. required DC Gate Voltage to trigger	4.0		T_J = - 40°C	Anode supply = 6V resistive load
		2.5		T_J = 25°C	
		1.7		T_J = 125°C	
I_{GT}	Max. required DC Gate Current to trigger	270	mA	T_J = - 40°C	
		150		T_J = 25°C	
		80		T_J = 125°C	
		40		T_J = 25°C, for 40TPS08A and 40TPS12A	
V_{GD}	Max. DC Gate Voltage not to trigger	0.25	V	T_J = 125°C, V_{DRM} = rated value	
I_{GD}	Max. DC Gate Current not to trigger	6	mA		

Thermal-Mechanical Specifications

	Parameters		40TPS..	Units	Conditions
T_J	Max. Junction Temperature Range		- 40 to 125	°C	
T_{stg}	Max. Storage Temperature Range		- 40 to 125		
R_{thJC}	Max. Thermal Resistance Junction to Case		0.6	°C/W	DC operation
R_{thJA}	Max. Thermal Resistance Junction to Ambient		40		
R_{thCS}	Max. Thermal Resistance Case to Heatsink		0.2		Mounting surface, smooth and greased
wt	Approximate Weight		6 (0.21)	g (oz.)	
T	Mounting Torque	Min.	6 (5)	Kg-cm	
		Max.	12 (10)	(lbf-in)	
	Case Style		TO-247AC		

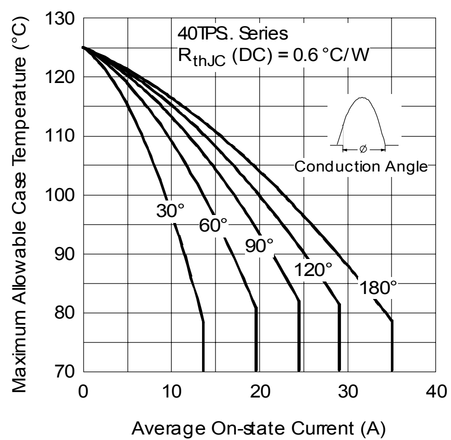


Fig. 1 - Current Rating Characteristics

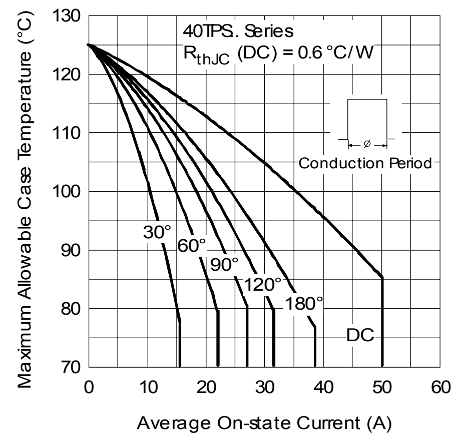


Fig. 2 - Current Rating Characteristics

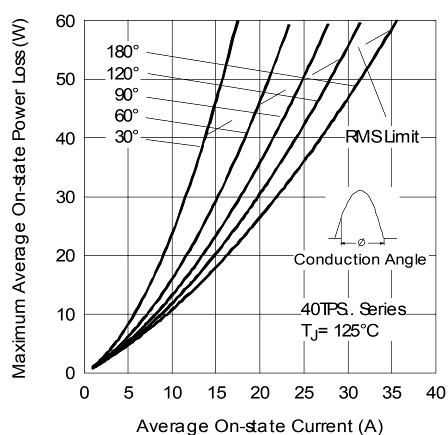


Fig. 3 - On-state Power Loss Characteristics

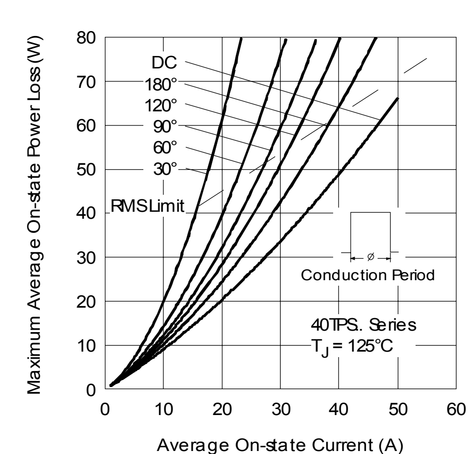


Fig. 4 - On-state Power Loss Characteristics

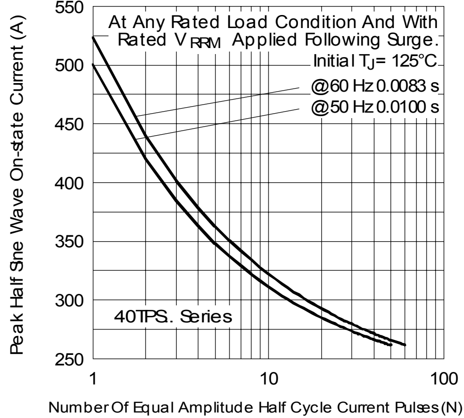


Fig. 5 - Maximum Non-Repetitive Surge Current

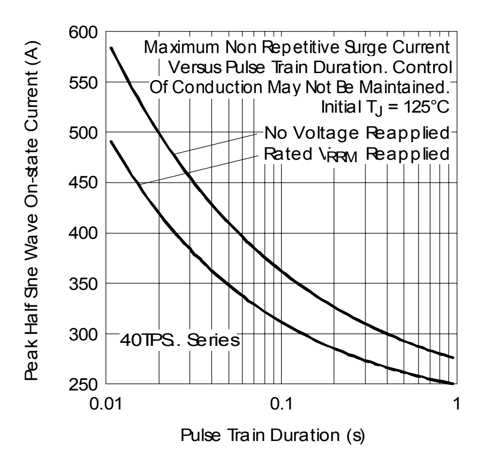


Fig. 6 - Maximum Non-Repetitive Surge Current

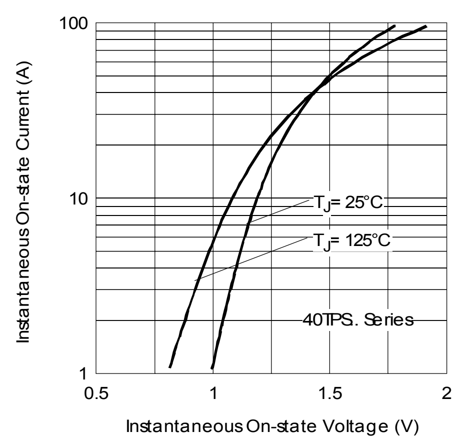


Fig. 7 - On-state Voltage Drop Characteristics

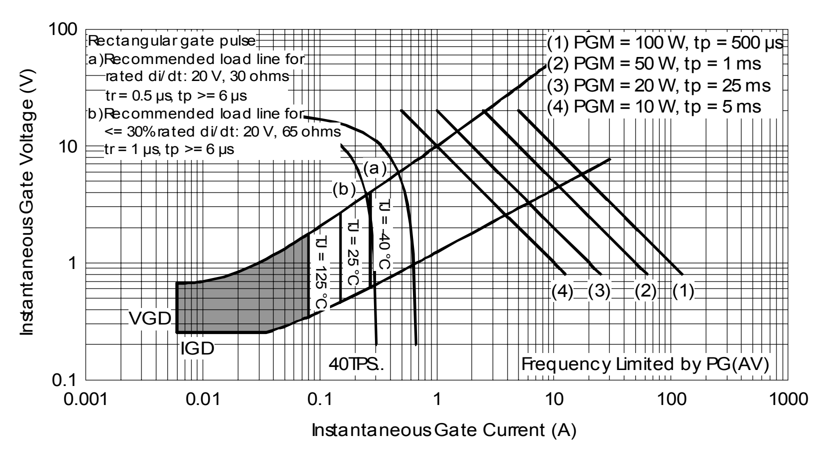


Fig. 8 - GateCharacteristics

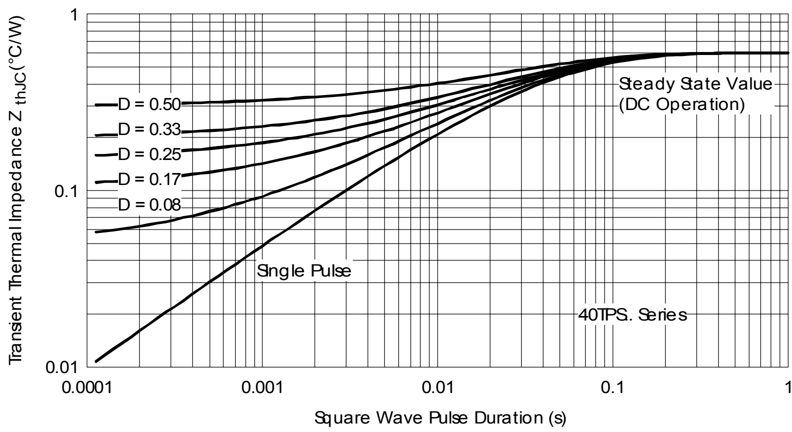
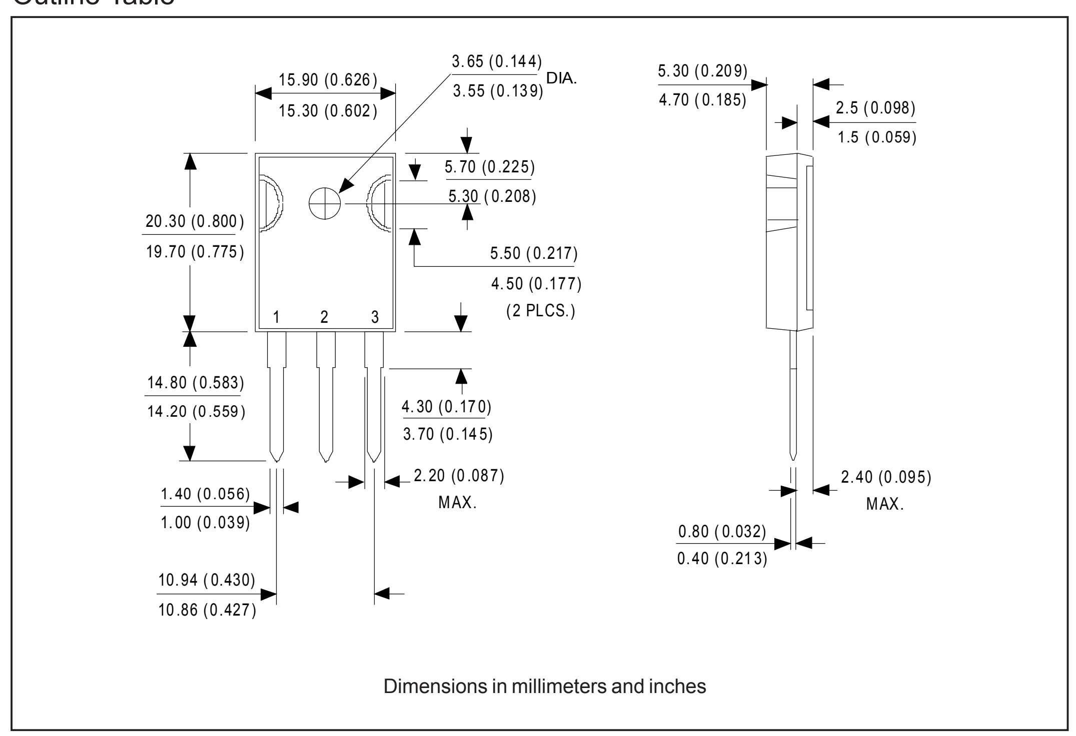
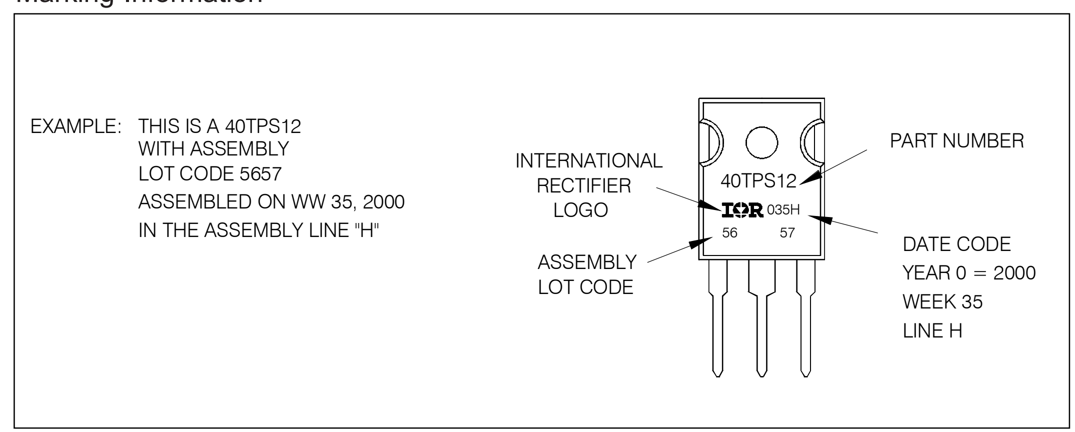


Fig. 9 - Thermal Impedance Z_{thJC} Characteristics

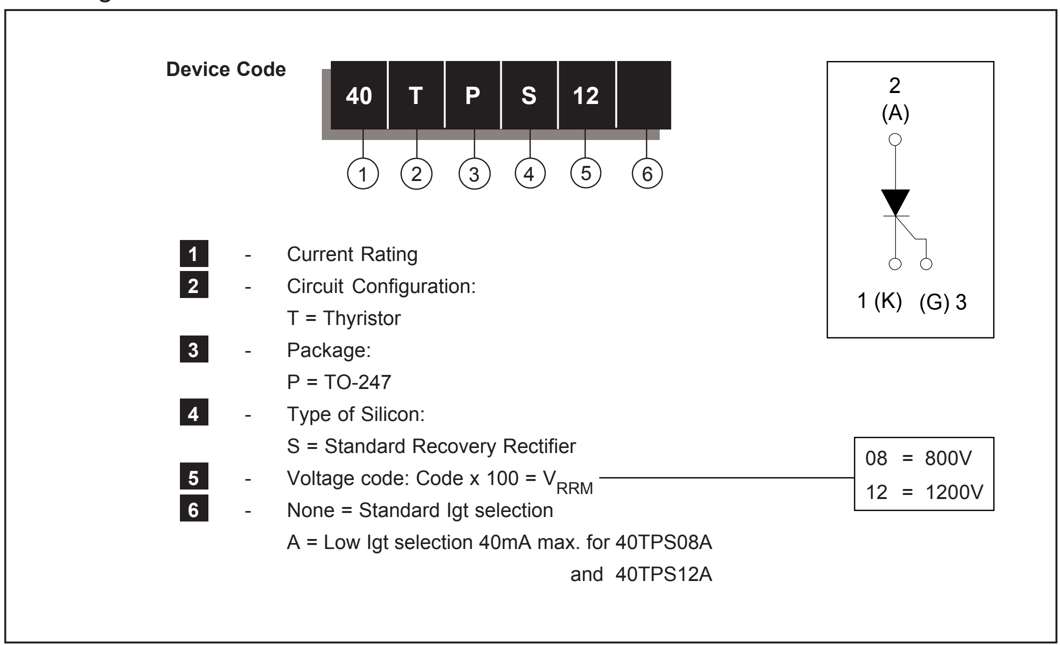
Outline Table



Marking Information



Ordering Information Table



Data and specifications subject to change without notice.
This product has been designed and qualified for Industrial Level.
Qualification Standards can be found on IR's Web site.



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